



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/580,695	05/30/2000	Kenneth J McCullough	950-009252-US (PAR)	2173

7590

10/24/2003

David Aker Esq.  
Perman & Green LLP  
425 Post Road  
Fairfield, CT 06430

EXAMINER
----------

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
----------	--------------

1764

DATE MAILED: 10/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/580,695

Applicant(s)

MCCULLOUGH ET AL.

Examiner

Jennifer A. Leung

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1 and 25 are objected to because of the following informalities:

- In claim 1, line 8, “a” should be omitted for proper grammatical form.
- In claim 25, line 9, “a” should be omitted for proper grammatical form.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5-11, 15-20 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, “said fluid” (line 6) lacks proper positive antecedent basis.

Regarding claims 19 and 20, the language of the claims is drawn to a method limitation which renders the claim vague and indefinite, as it is unclear as to the structural limitation applicant is attempting to recite by, “said fluid is supercritical carbon dioxide” or “said fluid further comprises an organic solvent”, since fluid is not considered an element of the apparatus.

Regarding claim 25, it is unclear as to the structural relationship between “said chuck assembly” in line 10 and the structural elements recited in lines 4-9 (i.e., a shaft, a generally circular chuck member, a sample holder). Also, “said openings” (line 16) lacks proper positive antecedent basis.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7, 9-20 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergman et al. (US 5,235,995).

Regarding claim 1, Bergman (FIG. 7; column 13, lines 42-49; column 14, lines 50-59) discloses an apparatus comprising a shaft (detachable shaft 354); a generally circular chuck member (wafer support 330 comprising plate 339), said shaft 354 extending from a first surface of said chuck member (i.e., back surface of plate 339); a sample holder (comprising fingers 334) associated with a second surface of said chuck member 330, said second surface (i.e., front surface of plate 339) being opposite said first surface; and a sample receiving assembly (i.e., distal ends 337 of fingers 334, comprising gripping notches 338) for holding the sample (i.e., wafer 20) so that the sample remains fixed to the sample holder 334 when the shaft 354 rotates and causes said chuck member 330 and sample holder 334 to rotate with the shaft 354.

Regarding claims 2 and 3, Bergman discloses chuck member 330 is generally shaped as a squat cylinder (FIG. 7) and has, at a periphery, means for propelling fluid comprising a plurality of grooves (i.e., flange 362, with outwardly facing parallel grooves 363; column 13, lines 37-41).

Regarding claim 4, Bergman discloses chuck member 330 has a plurality of openings extending therethrough in a direction parallel to the longitudinal axis (i.e., best seen in FIG. 14, the openings which receive fingers 334 and bushings 335; column 13, lines 50-60).

Art Unit: 1764

Regarding claims 5 and 25, Bergman (column 14, lines 46-64; FIG. 7) discloses said apparatus comprising, in combination, a reactor chamber (processing chamber **316**); a spindle assembly (comprising hollow motor shaft **353**) for receiving an end of shaft **354** distal from chuck member **330**; and a motor **359** for rotating spindle assembly **353** and shaft **354**.

Regarding claim 6, Bergman further discloses said chamber **116** is cylindrical, being that the chamber **116** is defined by processing *bowl* assembly **314**.

Regarding claim 7, Bergman discloses a first opening (supply port **378**; FIG. 7) through which reaction fluid is introduced and a second opening (drain port **396**; FIG. 7) through which reaction fluid is removed.

Regarding claim 9, Bergman discloses a temperature control means for controlling the temperature of reactor chamber **316** (i.e., via control of heat exchangers **578** or **580**; shown in the schematics of FIG. 26, column 24, lines 38-50).

Regarding claim 10, Bergman discloses said temperature control means comprises a mantle (i.e., annular chemical chamber **389**; column 24, lines 38-50) surrounding chamber **316**; and a temperature controller for said mantle (i.e., thermocouples and computer **530**).

Regarding claim 11, Bergman discloses said temperature control means controls the temperature to between 0 and 150 degrees C (column 6, lines 9-16).

Regarding claims 12-14, Bergman discloses said sample receiving assembly comprises at least one clip for holding sample **20** to the sample holder **334** (i.e., distal ends **337** of fingers **334**, comprising gripping notches **338**, inherently "clips"; FIG. 7, 14). Bergman further discloses a plurality of through holes in plate **339** of chuck member **330** wherein at least one of the through holes receives a fastener (i.e., bushing **335**).

Art Unit: 1764

Regarding claims 15 and 16, Bergman further discloses pressurizing apparatus for pressurizing reactor chamber **316**, wherein said pressurizing apparatus pressurizes said chamber **316** to a pressure of up to 10,000 psi (column 6, lines 17-25).

Regarding claims 17 and 18, as shown schematically in FIG. 1, Bergman discloses said pressurizing apparatus comprises a pump **65** for feeding pressurizing fluid from reservoir **60**, substantially a compressed gas cylinder, to produce the etchant vapor (column 9, lines 34-60).

Regarding claims 19 and 20, the apparatus of Bergman meets the claim since fluid is not considered an element of the apparatus.

Instant claims 1-7, 9-20 and 25 structurally read on the apparatus of Bergman et al.

4. Claims 1, 2, 12-14 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Du Gal (US 2,886,046).

Regarding claim 1, Du Gal discloses an apparatus comprising a shaft (spindle **46**); a generally circular chuck member (comprising impeller housing **33**), said shaft **46** extending from a first surface of said chuck member **33**; a sample holder (comprising locking rings **41, 42**) associated with a second surface of said chuck member **33**, said second surface being opposite said first surface; and a sample receiving assembly (baskets **38, 39**) for holding the sample so that the sample remains fixed to the sample holder **41, 42** when the shaft **46** rotates.

Regarding claim 2, Du Gal discloses said chuck member **33** comprises, at a periphery, means for propelling a fluid (impeller **47**; FIG. 2, 3; column 2, lines 61-67).

Regarding claims 12-14, Du Gal discloses said sample receiving assembly **38, 39** comprises at least one clip for holding the sample to said sample holder **41, 42**, said clip defined by a plurality of through holes (i.e., slots **37, 57**) formed in the sample holder **41, 42**, wherein

Art Unit: 1764

each hole 37, 57 receives a fastener (i.e., pins 56, 58) for securing the sample (located in baskets 38, 39) to the sample holder 41, 42 (column 3, lines 24-32; FIG. 3).

Regarding claim 25, the comments of claim 1 above apply. Furthermore, Du Gal discloses a reactor chamber (i.e., container 31, for holding a treatment liquid; FIG. 1); a spindle assembly (spindle 48 with hollow lower end; column 2 line 70 to column 3, line 4; FIG. 2, 3) for receiving an end of said shaft 46 distal from said chuck member 33; and a motor 24 for rotating said spindle assembly 48 and said shaft 46 (FIG. 1; column 3, lines 64-68).

Instant claims 1, 2, 12-14 and 25 structurally read on the apparatus of Du Gal.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 8 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergman et al. (S 5,235,995).

Regarding claim 8, Bergman et al. discloses said second opening (drain port 396; FIG. 7) being disposed proximate the wall of chamber 316. Although Bergman et al. are silent as to said

Art Unit: 1764

first opening (supply port 378) being disposed proximate shaft 354, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select such a location for the first opening in the apparatus of Bergman et al., on the basis of suitability for the intended use, since shifting location of parts was held to have been obvious. *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1950).

Regarding claim 21, although Bergman is silent as to said sample holder comprising a rectangular plate, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select an appropriate shape for the sample holder in the modified apparatus of Bergman et al., on the basis of suitability for the intended use, since it has been held that changes in shape involves only ordinary skill in the art. *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

Regarding claims 22-24, Bergman et al. disclose said sample receiving assembly comprises at least one clip for holding sample 20 to the sample holder 334 (i.e., distal ends 337 of fingers 334, comprising gripping notches 338, inherently "clips"; FIG. 7, 14). Bergman et al. further disclose a plurality of through holes formed in plate 339 of chuck member 330 wherein at least one of the through holes receives a fastener (i.e., bushing 335).

6. Claims 3-6 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Du Gal (US 2,886,046) in view of Risse (US 3,986,704).

Regarding claim 3, Du Gal discloses said chuck member 33 is generally shaped as a squat cylinder (see FIG. 3) and comprises a fluid propelling means in the form of a bladed impeller 47. However, Du Gal is silent as to whether the fluid propelling means of the chuck member 33 may instead comprise the recited plurality of grooves. In any event, it would have been an obvious



Art Unit: 1764

design choice for one of ordinary skill in the art at the time the invention was made to substitute the recited plurality of grooves for the fluid propelling means in the apparatus of Du Gal, since it has been held that the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958), and furthermore, the recited fluid propelling means is conventionally known in the art, as evidenced by Risse (i.e., in FIG. 1, propeller comprising cylindrical member **12** having helical grooves **22**).

Regarding claim 4, Du Gal further discloses said chuck member **33** has a plurality of openings extending therethrough in a direction parallel to its longitudinal axis (i.e., as defined by wire gauze **34**, **35**; FIG. 3; column 2, lines 51-52, 64-71).

Regarding claim 5, Du Gal further discloses said apparatus in combination with a reactor chamber (i.e., container **31**, for holding a treatment liquid; FIG. 1); a spindle assembly (spindle **48** with hollow lower end; column 2 line 70 to column 3, line 4; FIG. 2, 3) for receiving an end of said shaft **46** distal from said chuck member **33**; and a motor **24** for rotating said spindle assembly **48** and said shaft **46** (FIG. 1; column 3, lines 64-68).

Regarding claim 6, Du Gal discloses chamber **31** is cylindrical (see FIG. 1), wherein fluid *inherently* flows along a wall of said chamber in an opposite direction, as evidenced by the force of impeller **47**, which when rotated, urges the liquid downward (column 2, lines 61-64).

Regarding claims 19 and 20, the apparatus of Du Gal meets the claims, since fluid is not considered an element of the apparatus.

Regarding claim 21, although Du Gal is silent as to said sample holder **41**, **42** comprising a rectangular plate, it would have been an obvious design choice for one of ordinary skill in the

Art Unit: 1764

art at the time the invention was made to select an appropriate shape for the sample holder in the modified apparatus of Du Gal, on the basis of suitability for the intended use, since it has been held that changes in shape involves only ordinary skill in the art. *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

Regarding claims 22-24, Du Gal discloses said sample receiving assembly 38, 39 comprises at least one clip for holding the sample to said sample holder 41, 42, said clip defined by a plurality of through holes (i.e., slots 37, 57) formed on said sample holder 41, 42, wherein each through hole 37, 57 receives a fastener (i.e., pins 56, 58) for securing the sample (located in baskets 38, 39) to the sample holder 41, 42 (column 3, lines 24-32; FIG. 3).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung  
October 19, 2003



**HIEN TRAN  
PRIMARY EXAMINER**